

REMARKS

This is intended as a full and complete response to the Office Action dated November 26, 2003, having a shortened statutory period for response extended to expire on March 26, 2004. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1 - 69 remain pending in the application and are shown above. Claims 8 and 43 have been cancelled by Applicant. Claims 1 - 69 are rejected by the Examiner. Reconsideration of the rejected claims is requested for reasons presented below.

Applicants note that Page 4 of the Office Action dated November 26, 2003 was missing upon receipt. As such, we have included a paragraph below to discuss the likely rejection of claims 17-19, 47-58, and 63 which may have been described on missing page 4 of the Detailed Action.

Claims 1, 11, 15, 23, 39, 42, 47, 53, and 59 are amended to clarify the invention. These amendments are not presented to distinguish a reference, thus, the claims as amended are entitled to a full range of equivalents if not previously amended to distinguish a reference.

Claims 1, 2, and 8-10 stand rejected under 35 U.S.C. 102(e) as being anticipated by *Barth, et al.* (U.S. Publication No. 2002/0086523). Applicant respectfully traverses the rejection. The reference *Barth, et al.* does not teach, show, or suggest, the subject matter of claims 1, 2, 9, and 10 as amended. Claim 1 has been amended to incorporate the limitation of using atomic layer deposition for depositing a barrier layer having a thickness less than about 50 Å. Therefore, *Barth, et al.* does not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 50 Å", as recited in claim 1, and claims 2, 9, and 10 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 2, and 8-10 stand rejected under 35 U.S.C. 102(e) as being anticipated by *Farrar* (U.S. Publication No. 2002/0127845). Applicant respectfully traverses the rejection. The reference *Farrar* does not teach, show, or suggest, the subject matter of

claims 1, 2, 9, and 10 as amended. Claim 1 has been amended to incorporate the limitation of using atomic layer deposition for depositing a barrier layer having a thickness less than about 50 Å. Therefore, *Farrar* does not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 50 Å", as recited in claim 1, and claims 2, 9 and 10 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 2, 8-14, and 42-46 stand rejected under 35 U.S.C. 102(e) as being anticipated by *Pavate, et al.* (U.S. Publication No. 2002/0088716). Applicant respectfully traverses the rejection. Regarding claims 1, 2, and 8-10, the reference *Pavate, et al.* does not teach, show, or suggest, the subject matter of claims 1, 2, 9 and 10 as amended. Claim 1 has been amended to incorporate the limitation of using atomic layer deposition for depositing a barrier layer having a thickness less than about 50 Å. Therefore, *Pavate, et al.* does not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 50 Å", as recited in claim 1, and claims 2, 9 and 10 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claims 11-14, the reference *Pavate, et al.* does not teach, show, or suggest, the subject matter of claims 11-14 as amended. Claim 11 has been amended to incorporate the limitation of using a barrier layer having a thickness of less than about 50 Å. Therefore, *Pavate, et al.* does not teach, show, or suggest that "the barrier layer has a thickness of less than about 50 Å" as recited in claim 11, and claims 12-14 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claims 42-46, the reference *Pavate, et al.* does not teach, show, or suggest, the subject matter of claims 42-46 as amended. Claim 42 has been amended to incorporate the limitation of depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness of less than about 20 Å. Therefore, *Pavate, et al.* does not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness of less than about 20 Å" as recited in claim 42, and claims 44-46 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1-10, 15, 16, and 20-41 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Chen* (U.S. Patent No. 6,290,833). Applicant respectfully traverses the rejection. Regarding claims 1-10, the reference *Chen* does not teach, show, or suggest, the subject matter of claims 1-10 as amended. Claim 1 has been amended to incorporate the limitation of depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 50 Å. Therefore, *Chen* does not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 50 Å" as recited in claim 1, and claims 2-7, 9, and 10 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claims 15, 16, and 20-22 the reference *Chen* does not teach, show, or suggest, the subject matter of claims 15, 16, and 20-22 as amended. Claim 15 has been amended to incorporate the limitation of using a barrier layer having a thickness of less than about 50 Å. Therefore, *Chen* does not teach, show, or suggest that "the barrier layer has a thickness of less than about 50 Å" as recited in claim 15, and claims 16, and 20-22 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claims 23-29 the reference *Chen* does not teach, show, or suggest, the subject matter of claims 23-29 as amended. Claim 23 has been amended to incorporate the limitation of using a barrier layer having a thickness of less than about 50 Å. Therefore, *Chen* does not teach, show, or suggest that "the barrier layer has a thickness of less than about 50 Å" as recited in claim 23, and claims 24-29 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claims 30-41 the reference *Chen* does not teach, show, or suggest, the subject matter of claims 30-41. *Chen* teaches a barrier layer having a thickness approximately 100 to 300 Å. See Col. 5, lines 31-32. Therefore, *Chen* does not teach, show, or suggest "depositing a barrier layer to a sidewall coverage of about 50 Å or less" as recited in claim 30, and claims 31-41 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 59-62, 68, and 69 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Pavate, et al.* (U.S. Publication No. 2002/0088716) in view of *Hideki* (U.S. Patent No. 6,294,425). Applicant respectfully traverses the rejection. The

reference *Pavate, et al.* in view of *Hideki* does not teach, show, or suggest, the subject matter of claims 59-62, 68, and 69 as amended. Claim 59 has been amended to incorporate the limitation of depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å. Therefore, *Pavate, et al.* in view of *Hideki* does not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å" as recited in claim 59, and claims 60-62, 68, and 69 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 64-67 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Chen* (U.S. Patent No. 6,290,833) in view of *Hideki* (U.S. Patent No. 6,294,425) and further in view of *Pavate, et al.* (U.S. Publication No. 2002/0088716). Applicant respectfully traverses the rejection. The reference *Chen* in view of *Hideki* and further in view of *Pavate, et al.* does not teach, show, or suggest, the subject matter of claims 64-67 as amended. Claim 59 has been amended to incorporate the limitation of depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å. Therefore, *Chen* in view of *Hideki* and further in view of *Pavate, et al.* does not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å" as recited in dependent claims 64-67. Withdrawal of the rejection is respectfully requested.

Claims 17-19, 47-58, and 63 stand rejected under 35 U.S.C. 103(a) as being unpatentable over one of the previously mentioned references in view of *Hideki* (U.S. Patent No. 6,294,425). Applicants note again here that Page 4 of the Office Action dated November 26, 2003 was missing upon receipt. Applicant respectfully traverses the rejection. Regarding claims 17-19 none of the previously mentioned references in view of *Hideki* teach, show, or suggest, the subject matter of claims 17-19 as amended. As discussed above, Claim 15 has been amended to incorporate the limitation of using a barrier layer having a thickness of less than about 50 Å. Therefore, the references in combination do not teach, show, or suggest that "the barrier layer has a thickness of

less than about 50 Å" as recited in claim 15, and claims 17-19 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claims 47-52 none of the previously mentioned references in view of *Hideki* teach, show, or suggest, the subject matter of claims 47-52 as amended. Claim 47 has been amended to incorporate the limitation of depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å. Therefore, the references in combination do not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å" as recited in claim 47, and claims 48-52 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claims 53-58 none of the previously mentioned references in view of *Hideki* teach, show, or suggest, the subject matter of claims 53-58 as amended. Claim 53 has been amended to incorporate the limitation of depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å. Therefore, the references in combination do not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å" as recited in claim 53, and claims 54-58 dependent thereon. Withdrawal of the rejection is respectfully requested.

Regarding claim 63 none of the previously mentioned references in view of *Hideki* teach, show, or suggest, the subject matter of claim 63 as amended. Applicant respectfully traverses the rejection. As previously mentioned, Claim 59 has been amended to incorporate the limitation of depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å. Therefore, the references in combination do not teach, show, or suggest "depositing a barrier layer by atomic layer deposition, the barrier layer having a thickness less than about 20 Å" as recited in dependent claim 63. Withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicant's disclosure than the

primary references cited in the office action. Therefore, Applicant believes that a detailed discussion of the secondary references is not necessary for a full and complete response to this office action.

Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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